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(54) Agricultural harvester

(57) In a harvester with a container and a conveyor (for transferring crop from the harvester to the conveyor, there is provided a means to determine the weight of crop before or during the transfer. The means (a, b, c, d or e) may be positioned within the harvester or at the outlet of the conveyor.

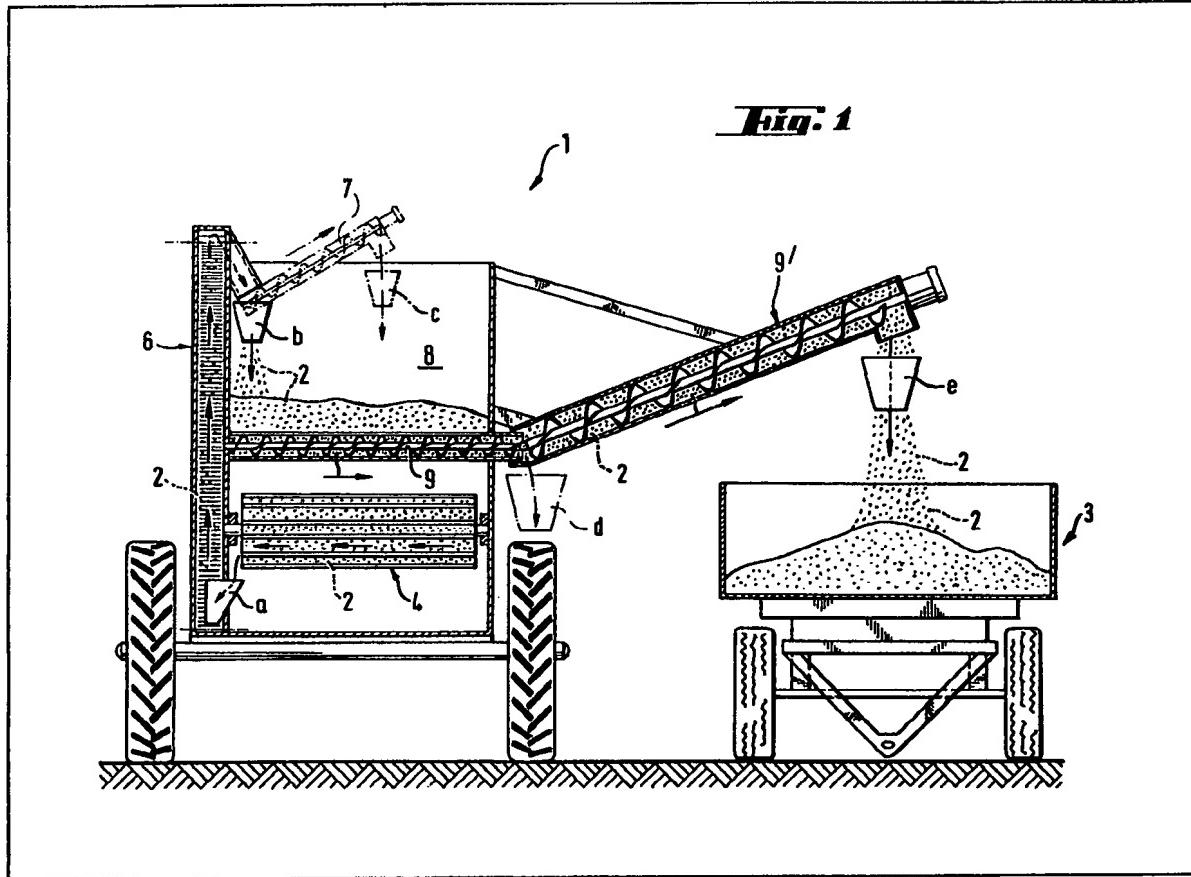
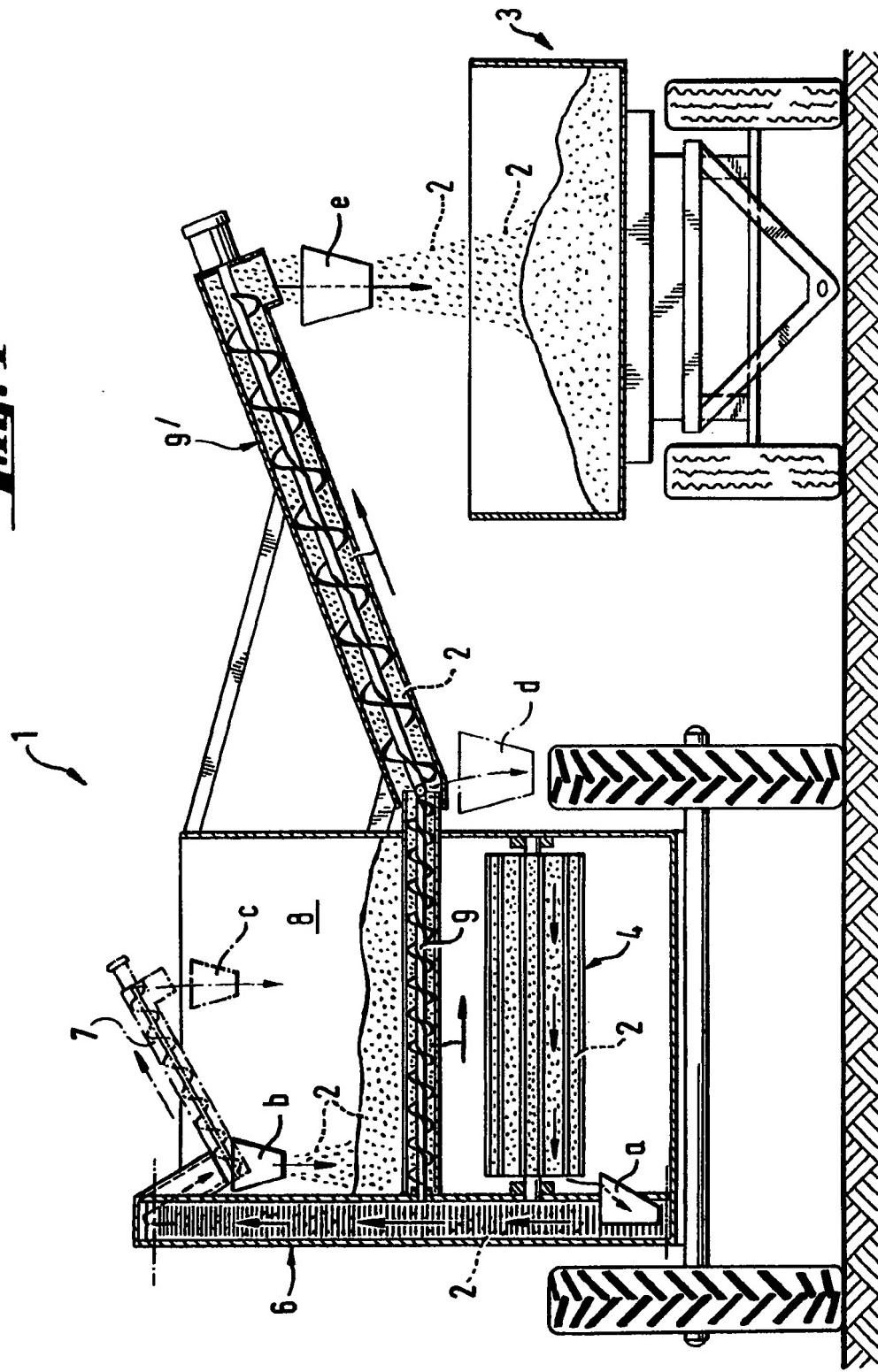


Fig. 1

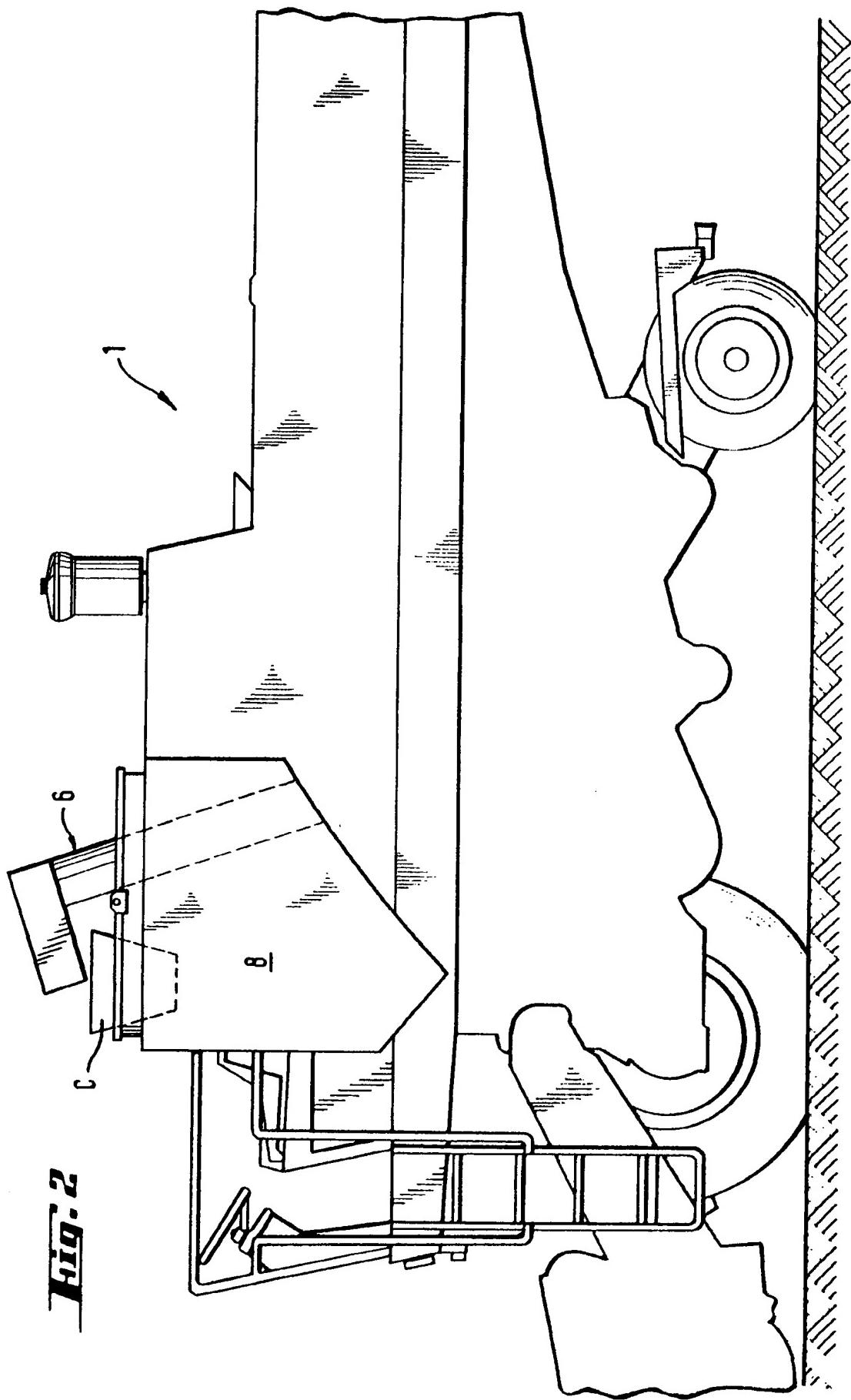
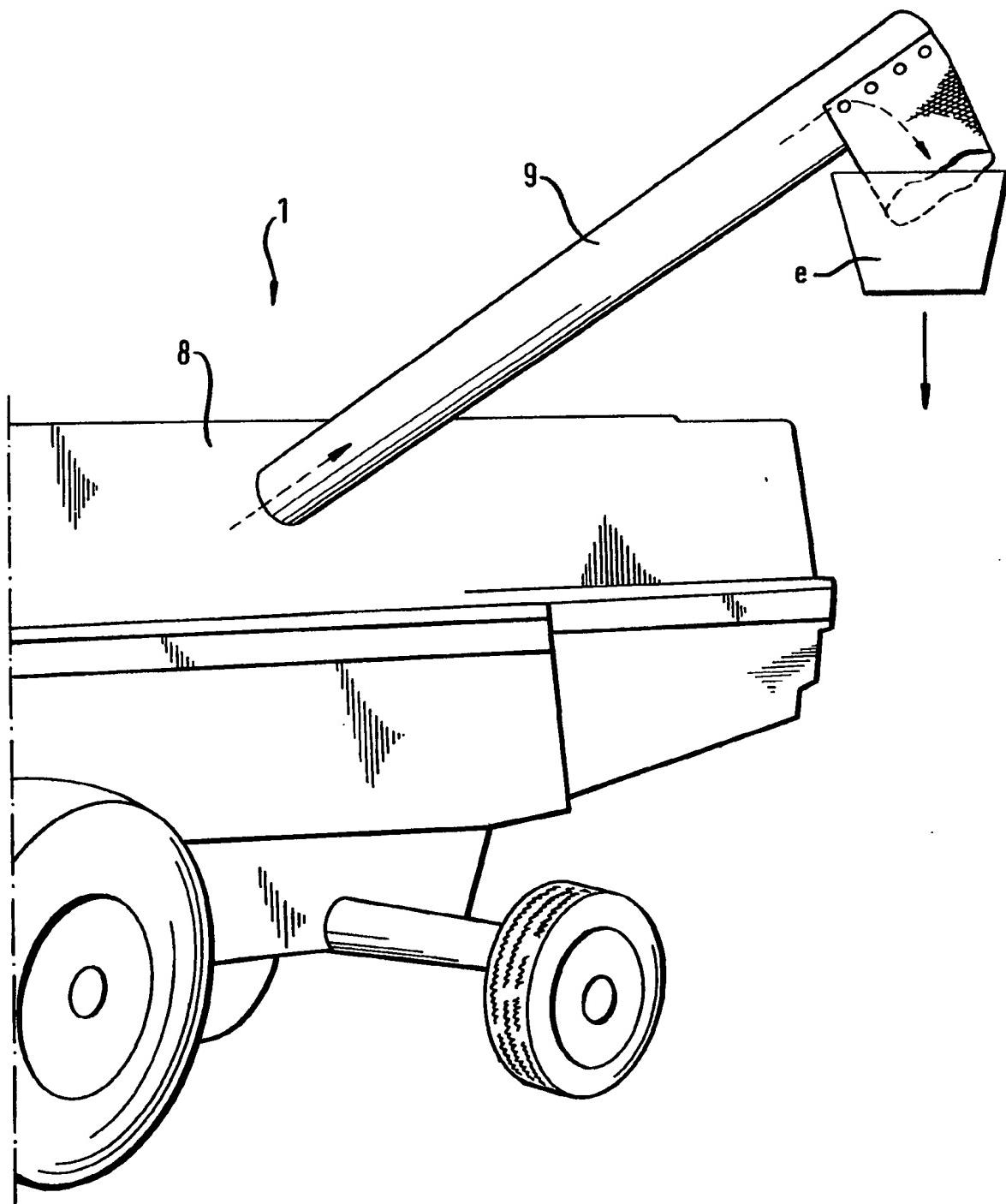


Fig. 2

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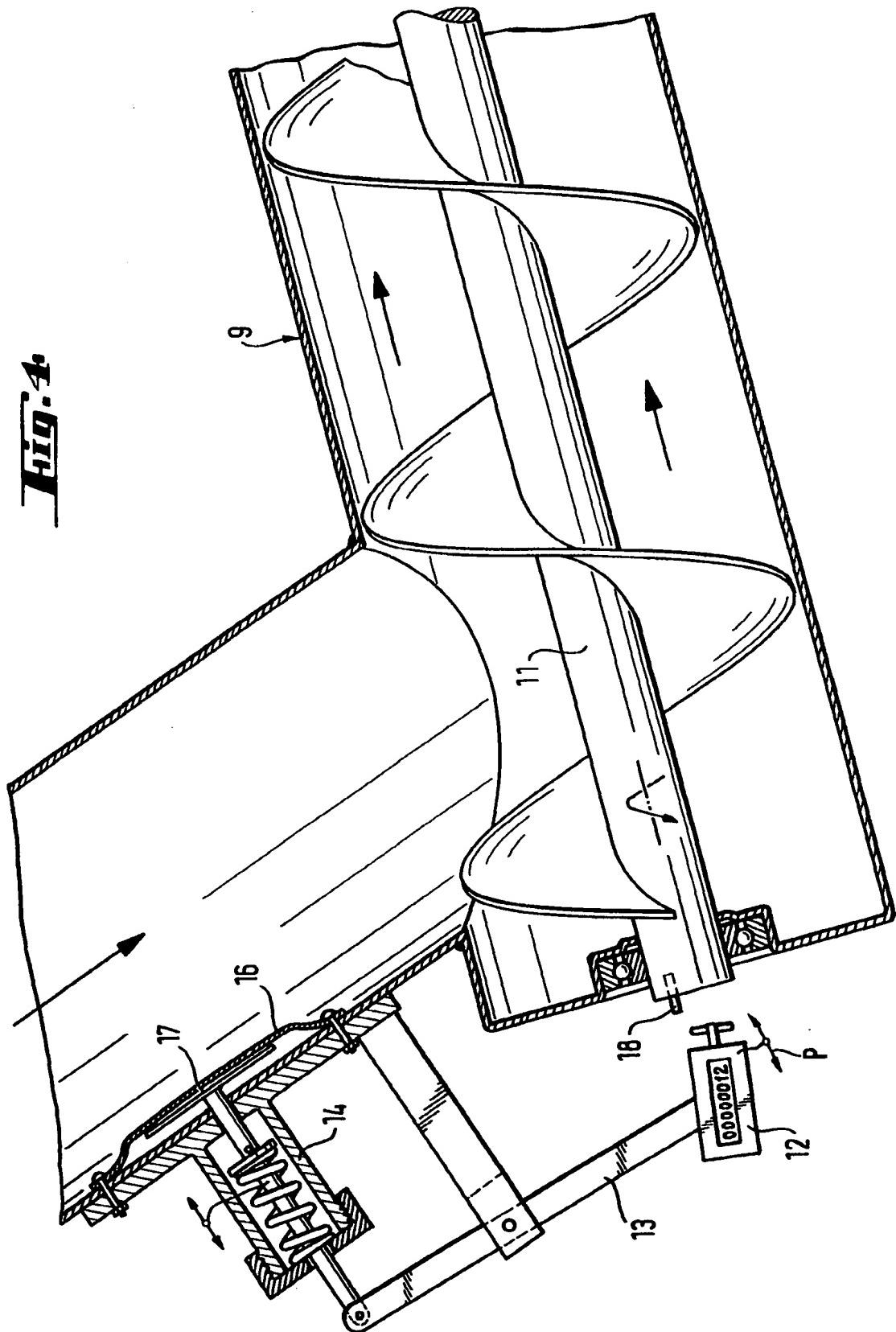
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Fig. 3



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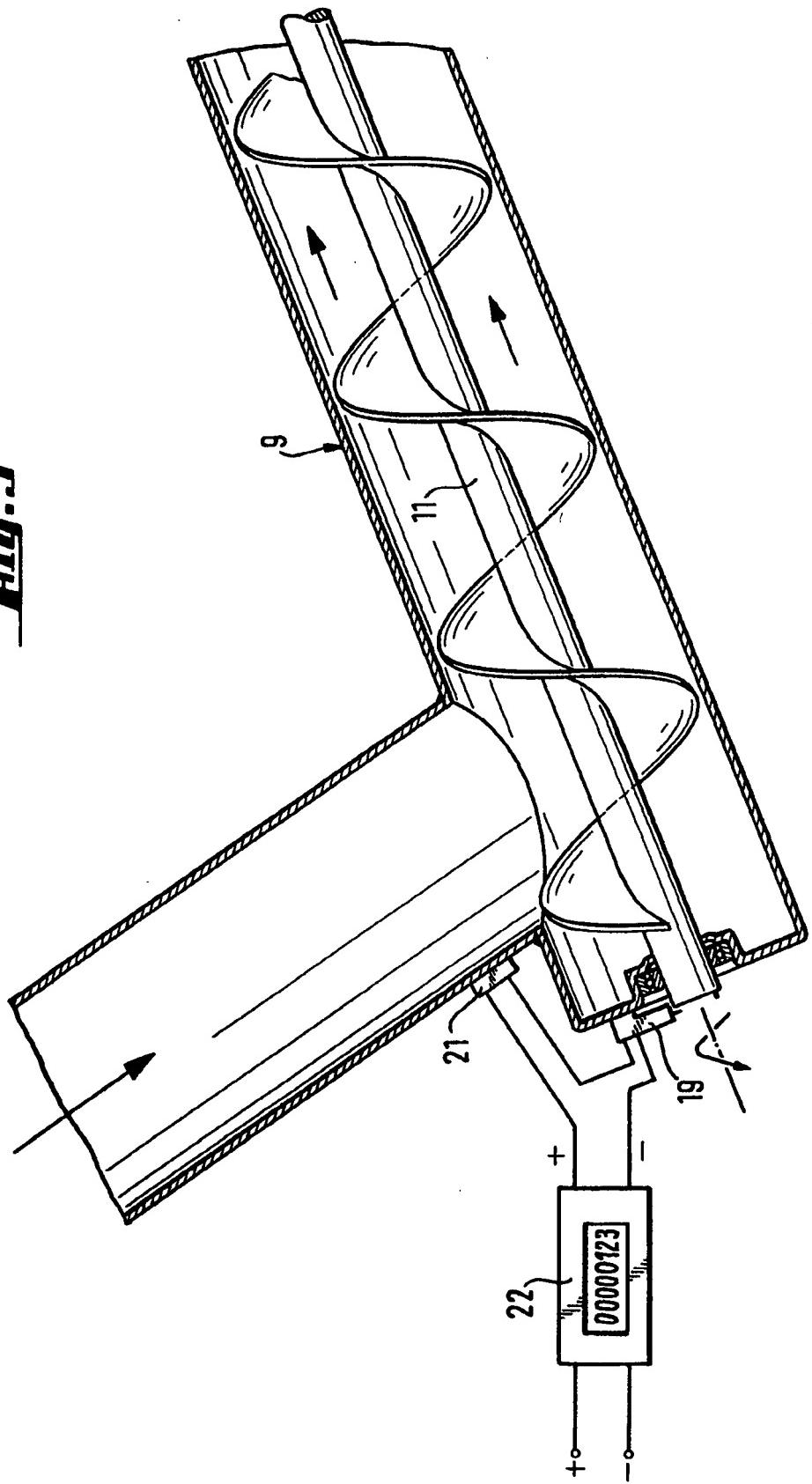
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Fig. 5



SPECIFICATION

Agricultural harvester

5 The invention relates to an agricultural harvester, in particular a harvester-thresher (or combine harvester), the operation of which is intended to be improved or perfected to the effect that at any time the farmer has an exact check of the quantity of crop 10 which has been harvested from one field or another.

More than 90% of the grain harvest for example takes place in known manner with harvester-threshers, which collect the threshed and clean corn in bulk in a container (hopper) located on the 15 harvester-thresher and depending on the quantity accumulated transfer the corn from time to time to prepared motor vehicles or their trailers, for example mechanically or pneumatically. The grain transferred in this way but the weight of which is not known 20 in most cases passes immediately into the so-called agricultural market or however into silos of the cooperatives, who determine by weighing the weight of grain delivered and then prepare the accounts.

25 The farmer as producer, who is generally under considerable pressure as regards time during the harvest, finds this procedure a drawback and considers it a lawful wish to be able to determine the weight of the harvested crop going into the market 30 himself. This is also true when the harvested crop does not pass immediately into the market, but is stored and accordingly corresponding arrangements are indispensable.

Dealing with the afore-mentioned wish of farmers 35 is the object on which the invention is based.

The harvester produced according to the invention - in this case a harvester-thresher - is characterised in that the weight or quantity of harvested crop can be weighed or ascertained before or during the transfer.

40 The invention will now be further described by way of example only with reference to the accompanying drawings, on which:-

Figure 1 is a diagrammatic illustration of the various embodiments of the invention,

45 *Figure 2* is a side view of a harvester-thresher, with a balance associated with the collecting container,

Figure 3 is a partial view of a harvester-thresher, in which an emptying worm with subsequent balance is associated with the collecting container,

50 *Figure 4* shows details and the arrangement of a mechanical counting device,

Figure 5 is like *Figure 4*, but with a counting device operating electrically or electronically.

As can be seen best from the diagrammatic 55 illustration according to *Figure 1*, various possibilities are illustrated, as to the point of a harvester-thresher 1 where the balance provided according to the invention is to be located, by which the harvested crop 2 is weighed or its weight is ascertained 60 mechanically or electronically and recorded, before it passes into a trailer 3 for example.

The harvester-thresher 1 essentially comprises in known manner a drum 4 cleaning and conveying the harvested crop 2, an elevator 6, and a collecting 65 container 8 and finally an emptying worm or device

9, 9', from which the harvested crop 2 passes to the loading surface of the trailer 3.

According to one preferred embodiment of the invention, the balance *a* is located in the immediate 70 vicinity of the drum 4 and the elevator 6. Another possibility would be the location of a balance *b* at the outlet of the elevator 6, from which the harvested crop 2 runs either directly into the collecting container 8 or is transferred to a worm conveyor 7 mounted 75 as a piece of additional equipment and from which it then passes from an elevated position into the collecting container 8, in which case a balance *c* is to be provided directly at the outlet of the worm conveyor 7. The provision or location of the former 80 balances or weighing devices can be incorporated without appreciably increasing the cost of the harvester-thresher, at the time of its manufacture, can be attached at a later time or can be supplied subsequently as an additional piece of equipment.

85 It is also conceivable to arrange a balance *d* provided according to the invention in the region of the outlet opening of the collecting container 8, or, however, to locate a balance *e* at the emptying opening of the emptying worm or device 9, by which 90 the harvested crop is conveyed into the trailer 3 for example.

Since the emptying of the collector container 8 should take place with a quantity of between two to six tons within several minutes, then as regards the 95 balances *d* and *e*, a balance with a very great hourly output must be provided.

As regards the balances *a*, *b* and *c*, during the threshing operation, a quite uniform, light flow of grain occurs, which would be measured with a 100 relatively small, commercially available continuous grain weigher.

Also of particular advantage are rubber conveyor belts with supports, with which an electronic weighing device is located below the conveyor belt.

105 For the subsequent equipping of existing harvester-threshers, the arrangement of the balance *c* above the collecting container 8 is particularly suitable, in which case by means of a shorter worm conveyor, which can be driven both electrically,

110 hydraulically or even directly, the grain to be weighed is conveyed from the outlet of the existing elevator upwards into the balance *c*, in order to carry out the weighing of the harvested quantities of grain at this point.

115 Normally, weighing devices of the aforementioned type are equipped with a counter, so that each harvested quantity or each daily output can be read and recorded from the harvester-thresher driver's seat, irrespective of the nature of the grain, since 120 only the effective weight is recorded.

In a refined embodiment, even the corresponding quantities could be printed out.

125 A further possibility for ascertaining the grain harvested - see in particular Figures 4 and 5 - would also be conceivable using a measurement of the emptying worm 9, in which by counting the number of revolutions of the worm, the quantity could likewise be ascertained by way of its hectoliter weight. The quantity harvested can be read off quite 130 accurately with a conversion table or a calculator for

the most varied types of grain, multiplied by the revolutions counted. For a very accurate determination of weight, with varying qualities of grain, weighing of a sample of the individual types should 5 be carried out previously.

Due to sensors or probes to be incorporated, it is thus ensured that only the revolutions of the worm 9 filled with harvested crop 2 are counted.

10 CLAIMS

1. Agricultural harvester, in particular harvester-thresher with a container receiving the harvested crop, from which the crop can be transferred for 15 example by an elevator or conveyor belt into a prepared motor vehicle or trailer, wherein the weight or quantity of the harvested crop can be weighed or ascertained before or during the transfer.

2. Harvester according to claim 1, wherein the 20 weighing operation is carried out by means of a continuous weigher or balance which can be operated mechanically, electrically, pneumatically or hydraulically.

3. Harvester according to claim 1, wherein the 25 balance is positioned at the harvested crop inlet of the elevator, which conveys the harvested crop upwards into the harvested crop container for example of the harvester-thresher.

4. Harvester according to claim 1, wherein the 30 balance is positioned directly at the outlet of the elevator, from where the harvested crop runs into the container.

5. Harvester according to claim 1, wherein the 35 weight of the crop harvested is ascertained in that following the elevator is a worm conveyor serving as an additional device, which conveyor conveys the crop further upwards into the balance, from which the crop passes into the collecting container.

6. Harvester according to claim 1, wherein the 40 balance is located in the region of the outlet opening of the container, namely at the point where the emptying worm or device following the container is located.

7. Harvester according to claim 1, wherein the 45 balance is located at the end of the emptying device - namely in the region of its outlet opening for the harvested crop - from which the crop passes into the prepared trailer or a motor vehicle.

8. Harvester according to claim 1, wherein the 50 weight of the harvested crop is ascertained in that the revolutions of a full emptying worm are counted mechanically.

9. Harvester according to claim 1, wherein the 55 weight of the harvested crop is ascertained in that the revolutions of a fully emptying worm can be counted electricaly or electronically.

10. Harvester according to claim 1, wherein the 60 weighing of the harvested crop take place by way of an electronic continuous weighing device, which is preferably connected to a conveyor belt.

11. Harvester according to claim 1, wherein a so-called depositing weighing device is provided, i.e. a device in which when closed, a weighing container receives a certain quantity of harvested crop and the 65 base of the container which is spring loaded for

example and constructed in the manner of a flap opens as soon as a desired weight of harvested crop is reached.

12. Harvester according to claim 1, wherein the 70 shaft of the worm conveyor is connected to a counter, which can be actuated by way of a push button pivoted on a rocker arm.

13. Harvester according to claim 12, wherein the 75 push button comprises a plunger protected by a diaphragm, which plunger actuates the rocker arm under the influence of the harvested crop so that the counting unit comes into or out of engagement with a pinion.

14. Harvester according to claim 9, wherein the 80 shaft of the worm conveyor is connected to a counting switch operating electrically or electronically, which can be switched by a momentary-contact switch able to be controlled by the quantity of crop harvested and which controls a counter or calculator.

15. A combine harvester substantially as herein described with reference to and as illustrated in the accompanying drawings.

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